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Spann et al.

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(54) **PROTECTION AND CONTAINMENT SYSTEM FOR CO-PACKAGED CONTAINERS**

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B65D 21/02 (2006.01)
B65D 85/30 (2006.01)

(52) **U.S. Cl.** **220/23.83**; 220/23.88; 206/585; 206/501; 206/509

(58) **Field of Classification Search** 206/585, 206/599, 488, 486, 501, 514, 512, 821, 386, 206/495, 499, 503, 505, 509; 220/1.5, 1.6, 220/23.89, 23.83, 23.88, 521, 23.91, 23.87, 220/4.27, 4.26, 23.86
See application file for complete search history.

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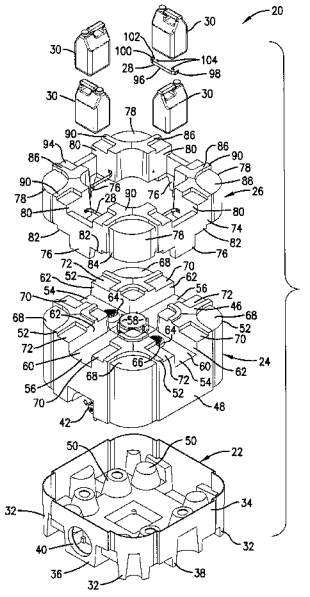
(57) **ABSTRACT**

A protection and containment system for co-packaged containers is provided which includes a hollow primary container, a top protector complementally configure to fit atop the primary container, and at least one retainer coupled to the top protector for holding a secondary container. The primary container has a circumscribing upright sidewall and an opening configured for receiving material to be stored in the container. The top protector includes a side wall and at least a pair of spaced-apart opposed risers, most preferably provided as one of four corner modules, the risers extending upwardly from the primary container above the opening and presenting a gap between the risers which is sized and configured for receiving the secondary container. Several retainers can be provided, either to hold the secondary containers in different gaps, or provided in tandem to hold two secondary containers adjacent to one another in or proximate a single gap.

15 Claims, 11 Drawing Sheets



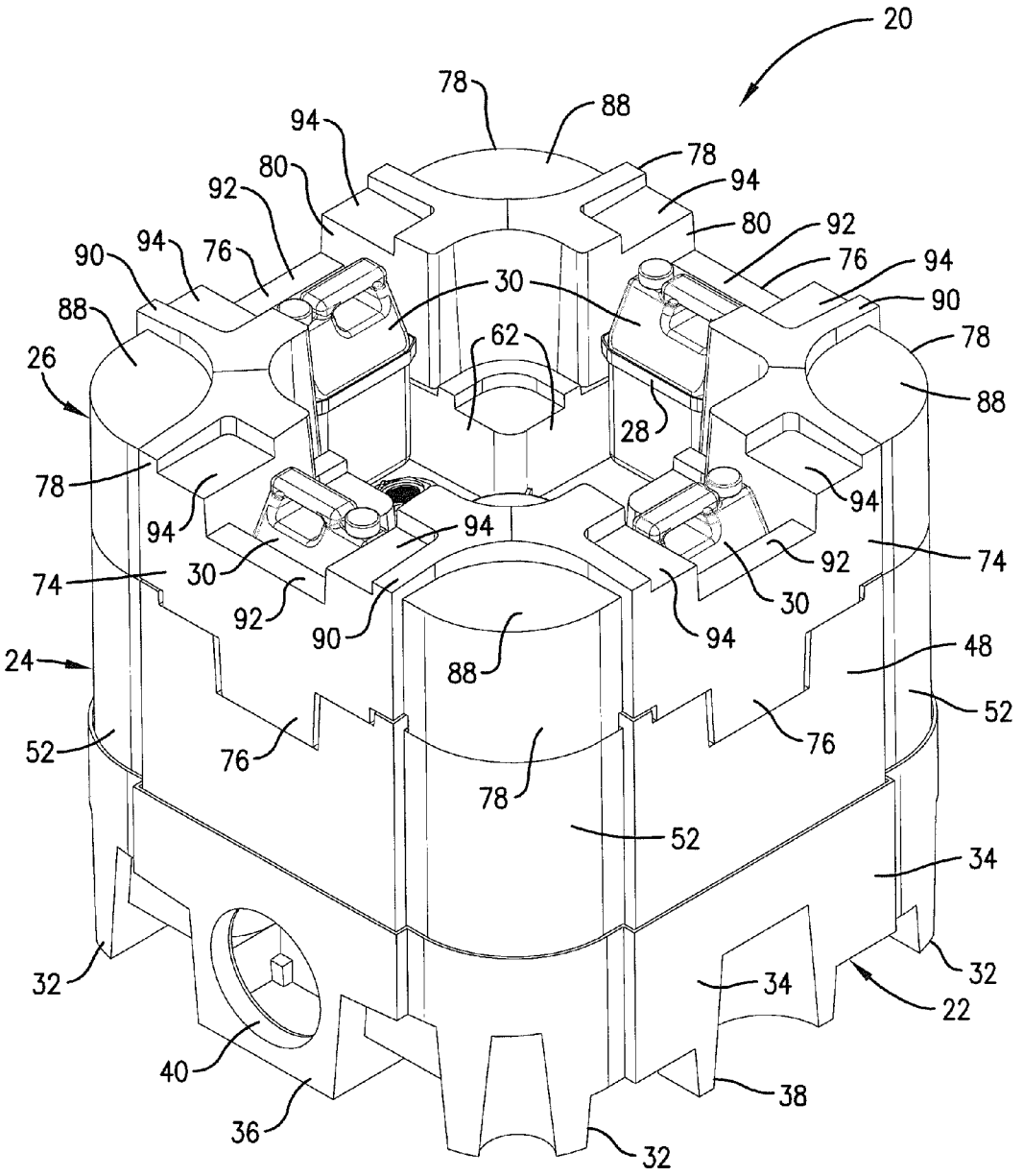

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Fig. 1.

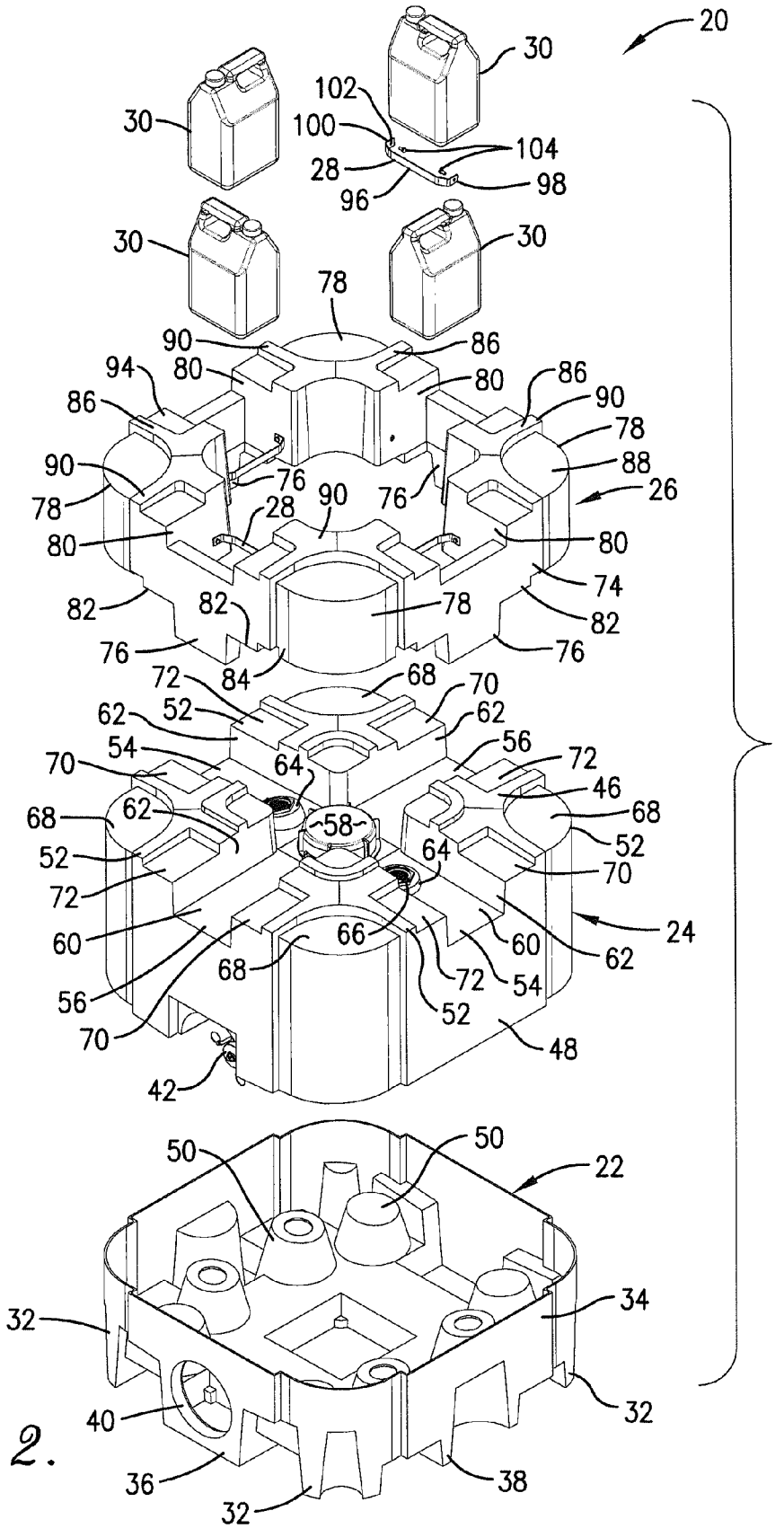
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Fig. 2.

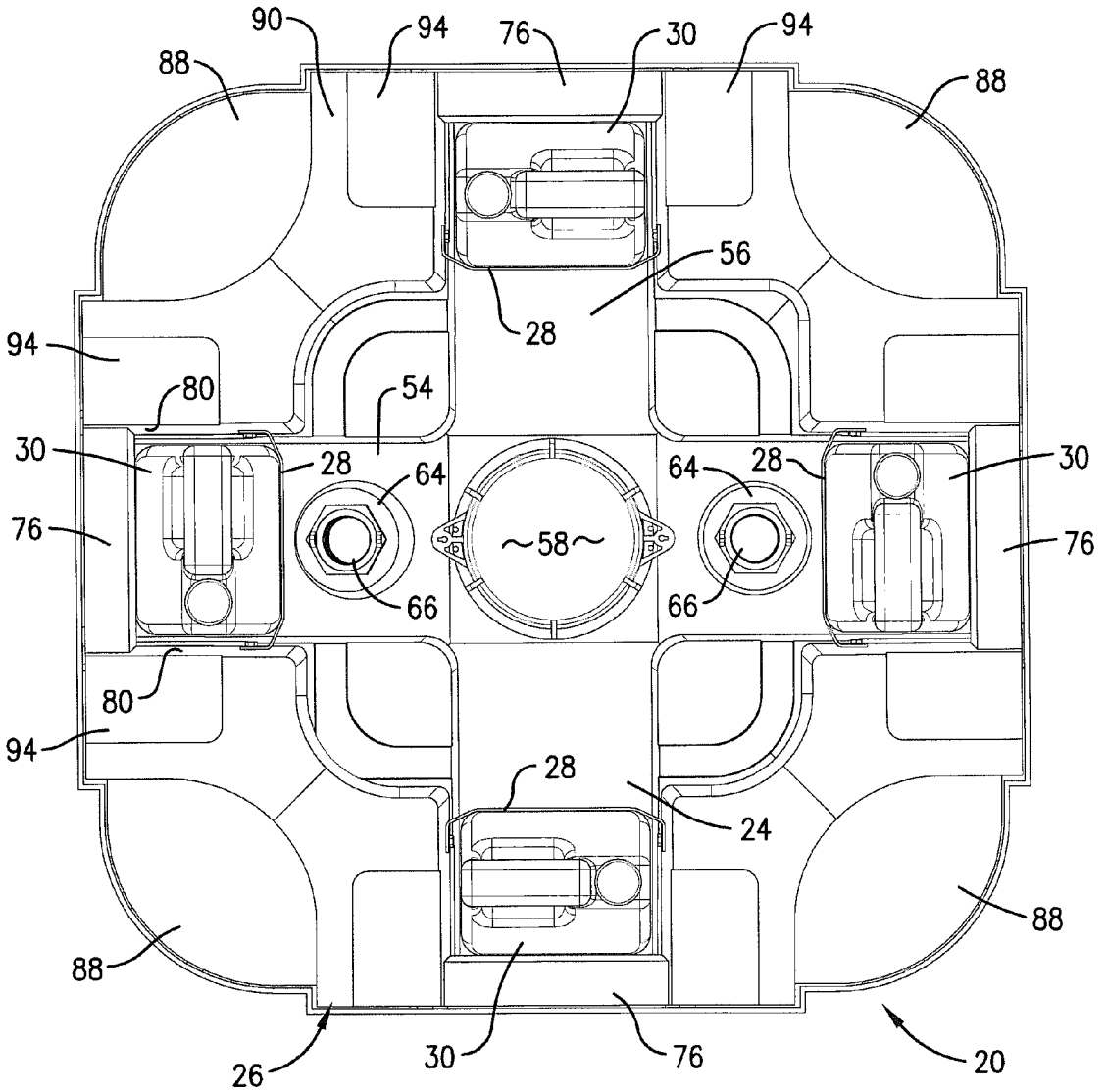
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Fig. 3.

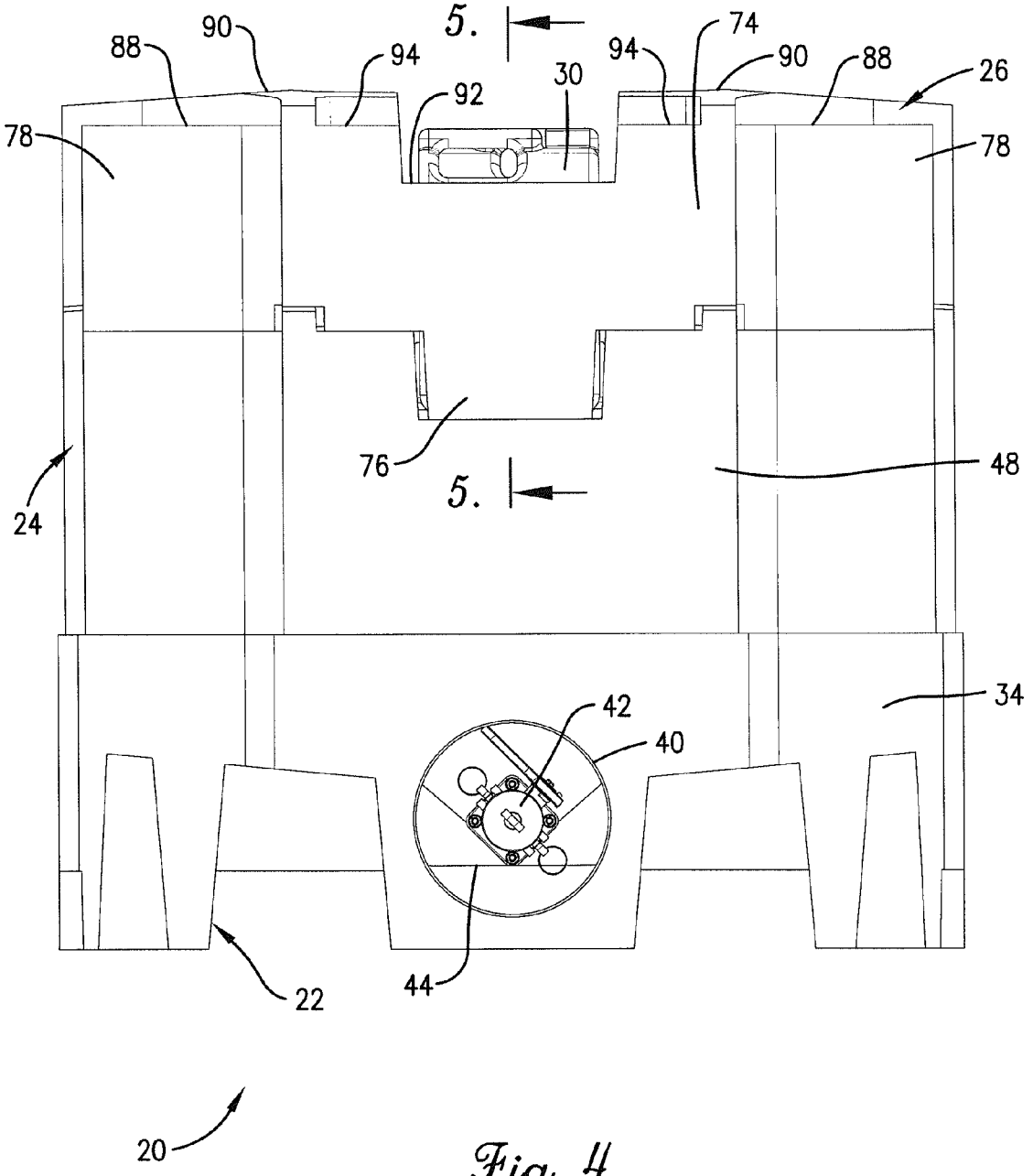

Fig. 4.

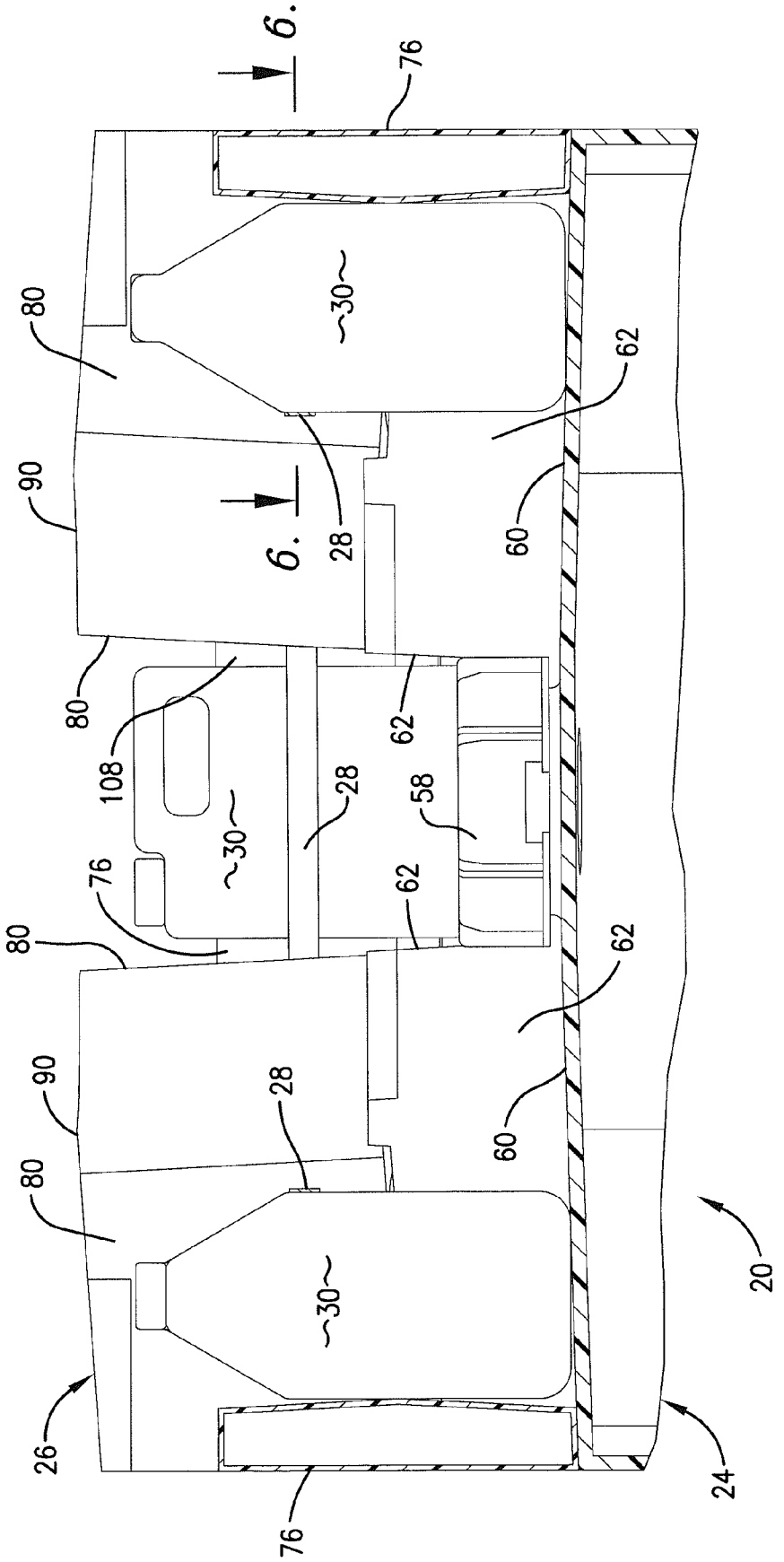

Fig. 5.

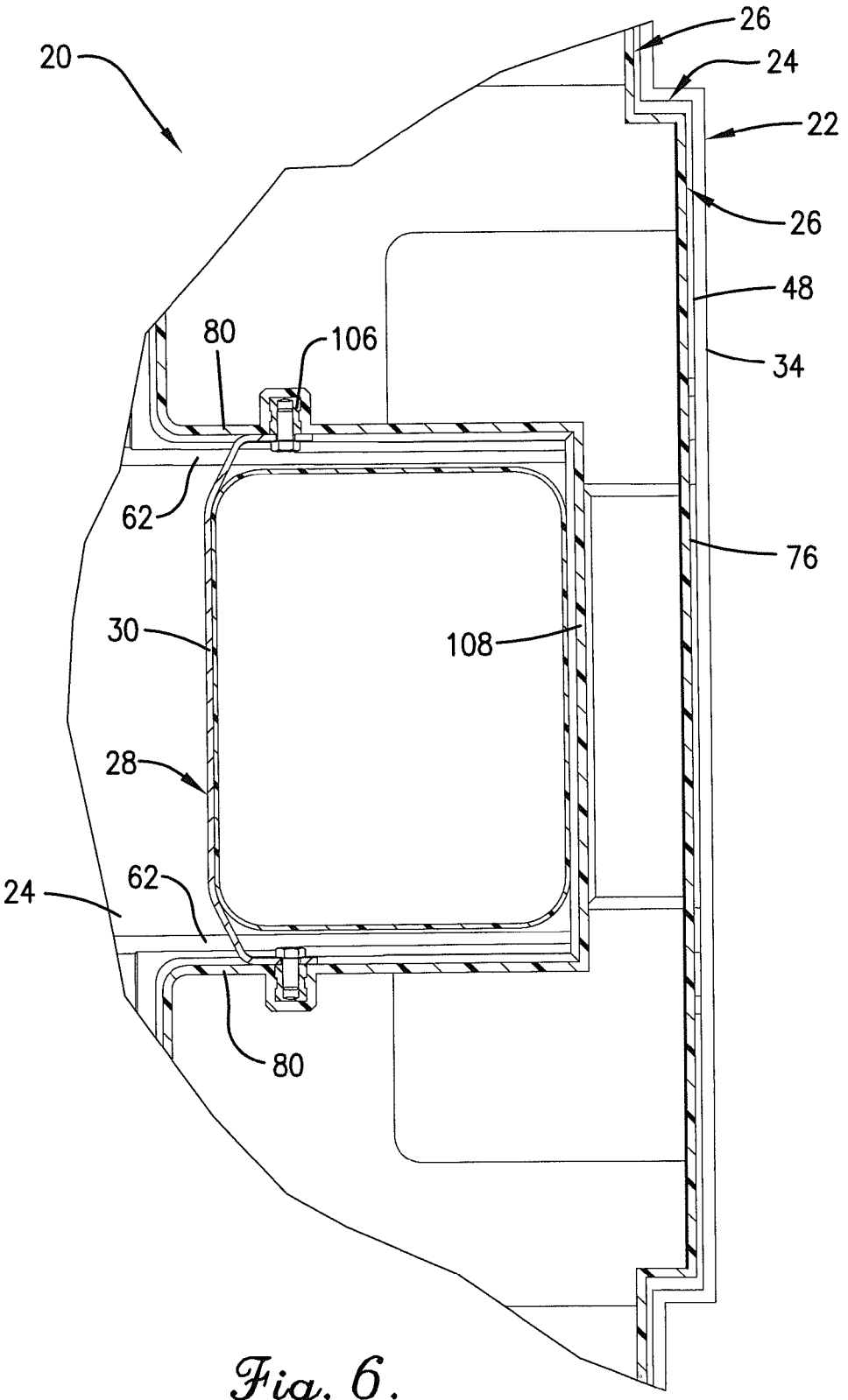

Fig. 6.

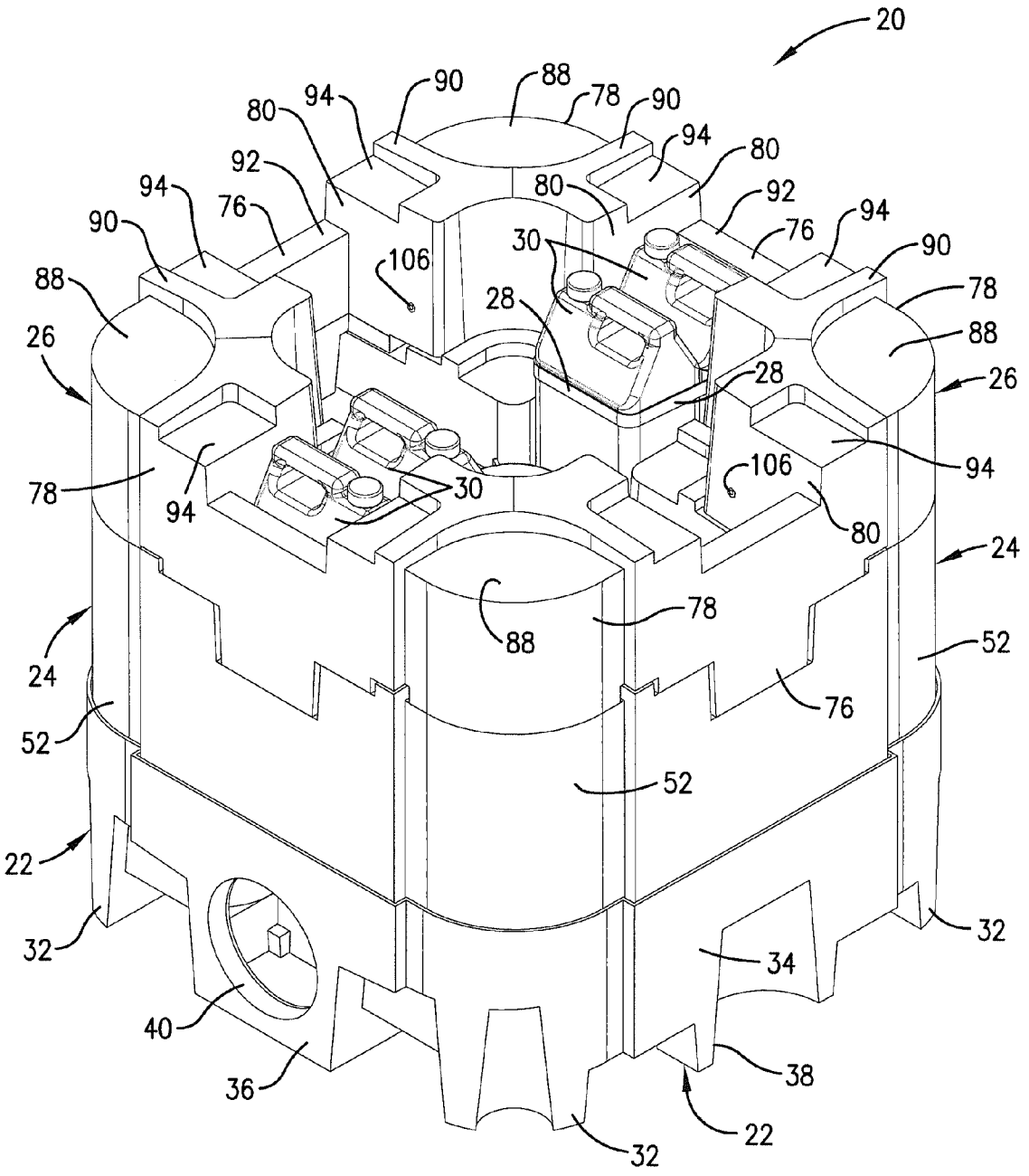
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Fig. 7.

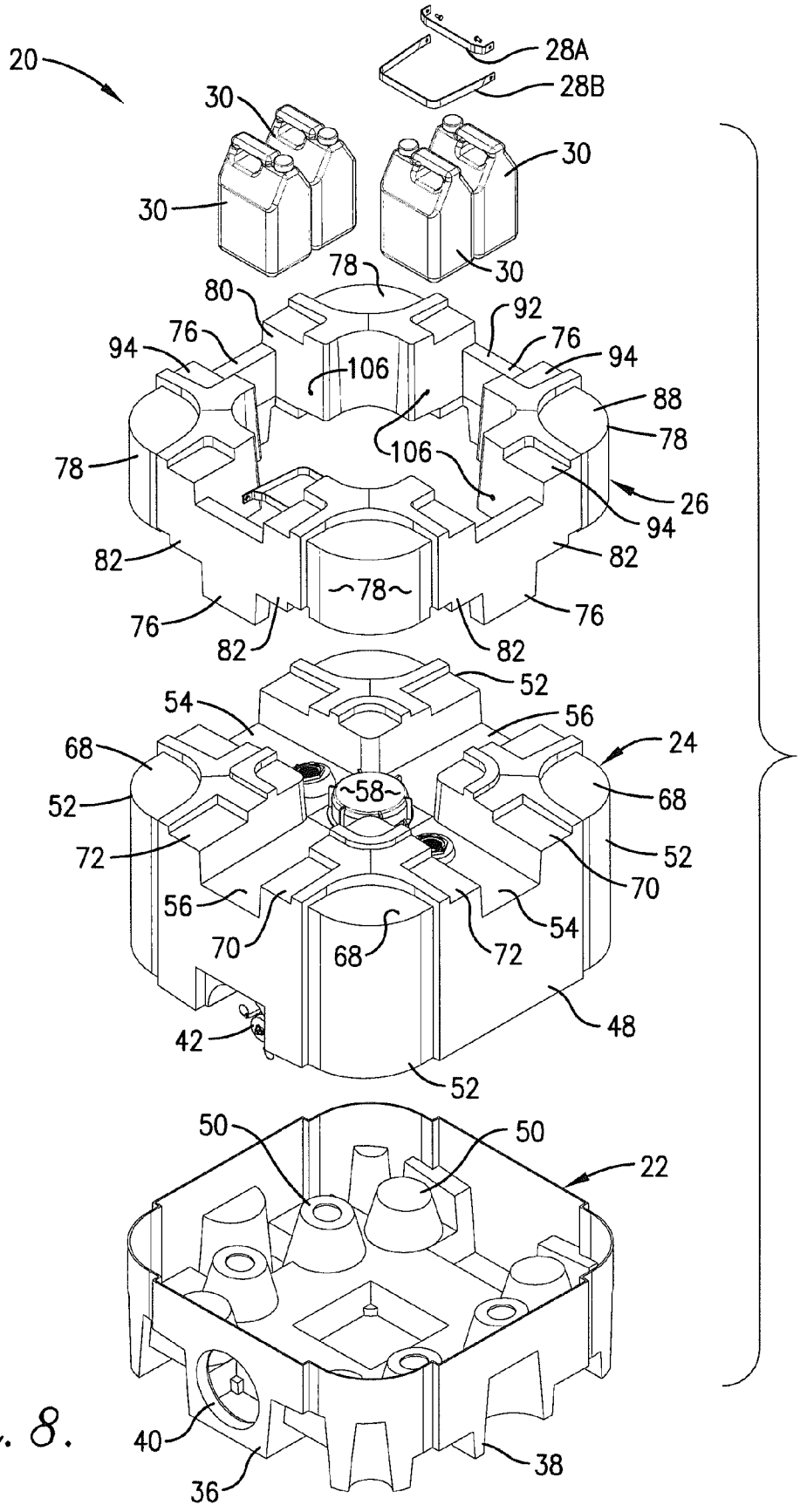
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Fig. 8.

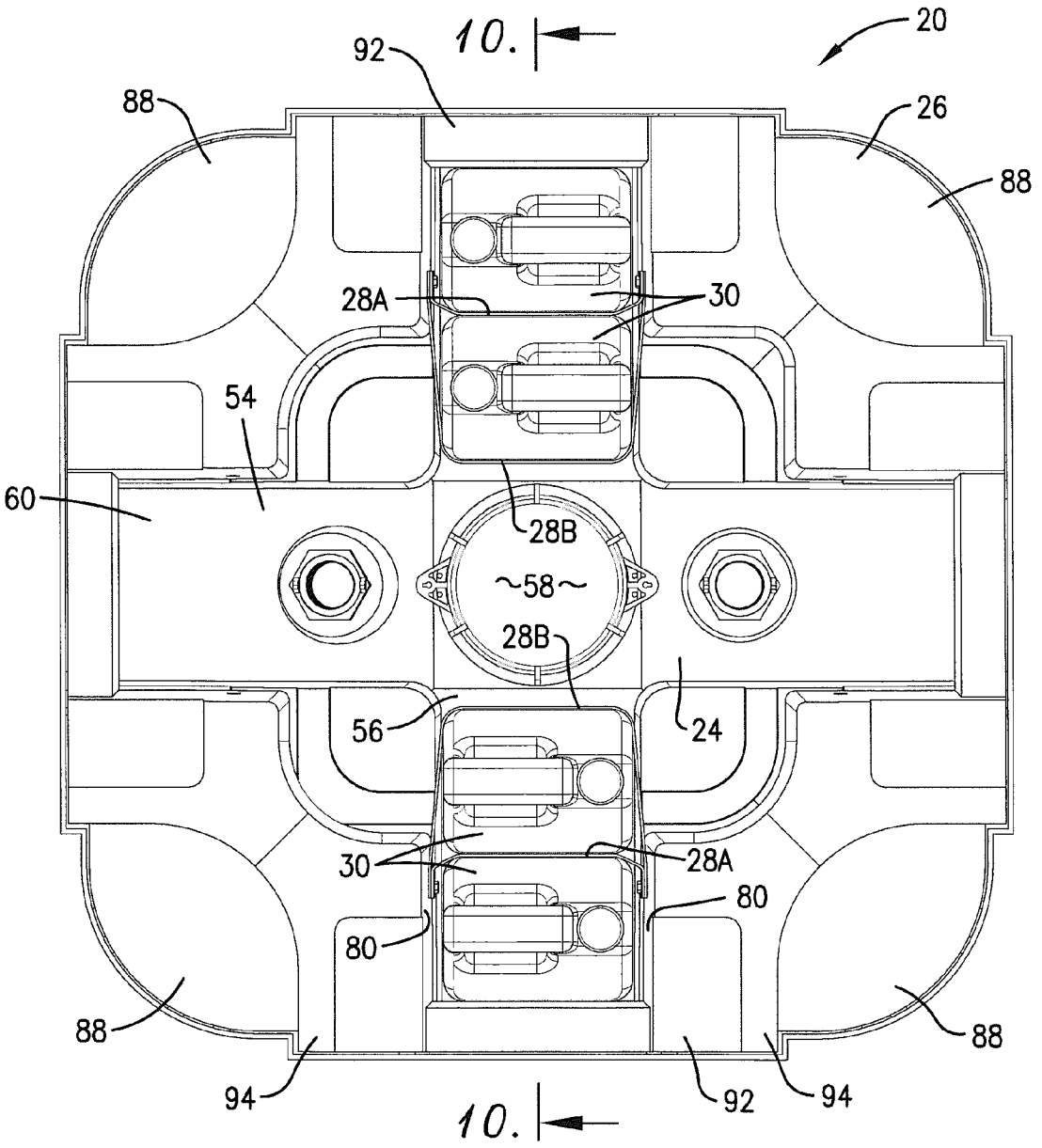
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Fig. 9.

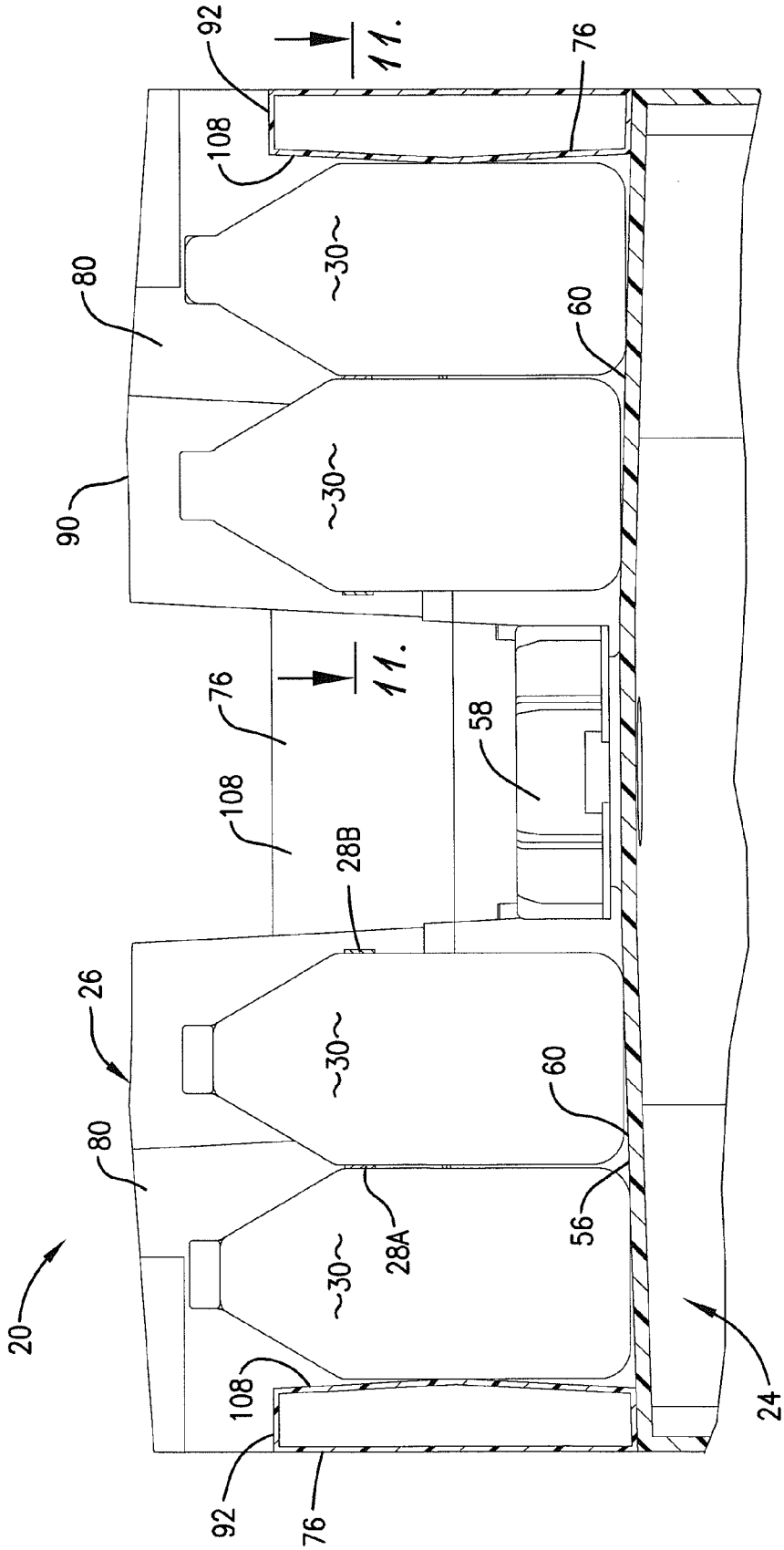
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Fig. 10.

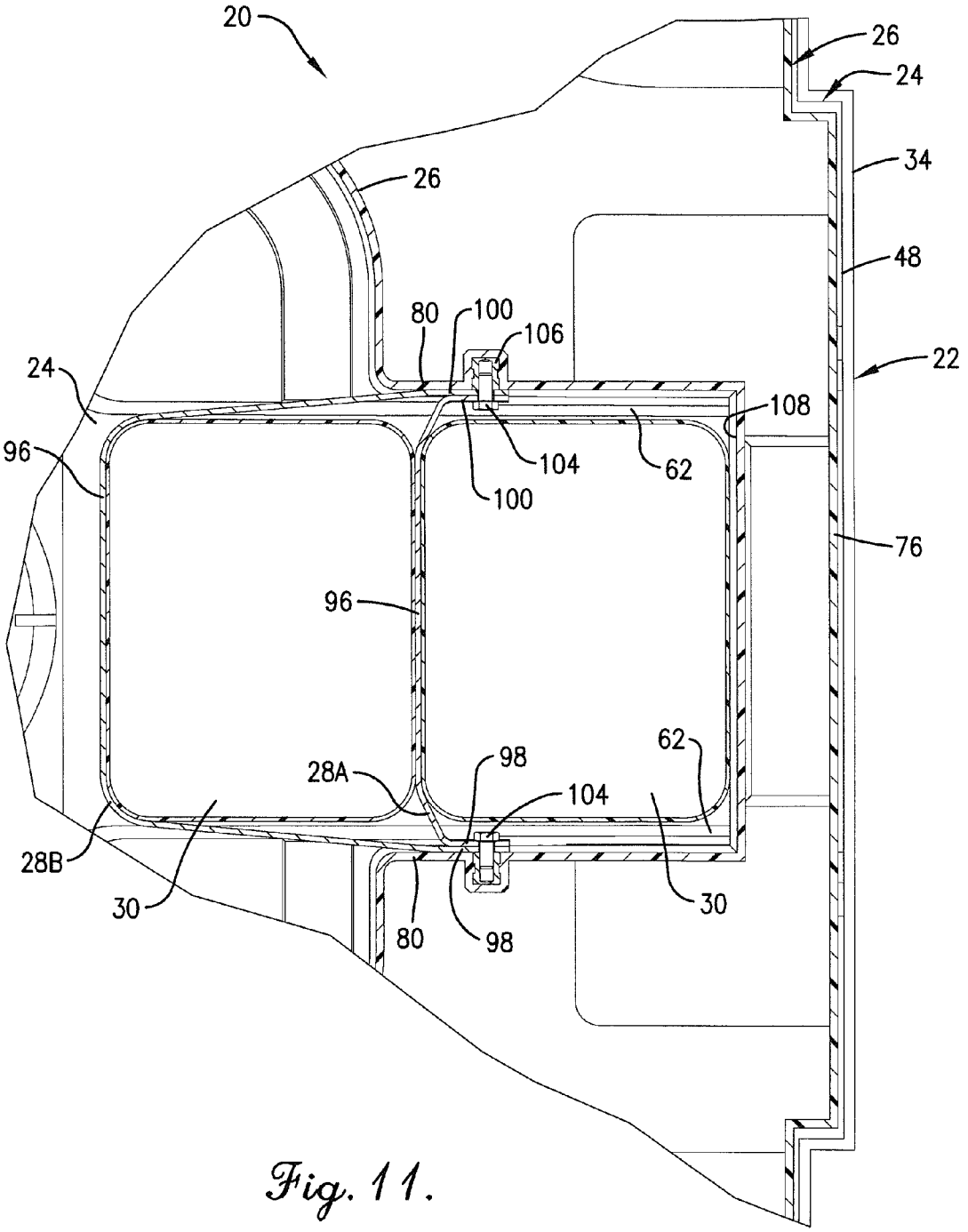
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Fig. 11.

PROTECTION AND CONTAINMENT SYSTEM FOR CO-PACKAGED CONTAINERS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention concerns a system for storage and transportation of containers where a primary container system is adapted for mounting one or more secondary containers in a secured and protected condition. More particularly, it is concerned with a protection and containment system whereby the secondary containers can be stored and transported in combination with the primary container, and the system can be stacked atop a similarly configured protection and containment system.

2. Description of the Prior Art

It is often necessary to store chemicals in liquid and dry form in containers. Small containers in a variety of different configurations have been developed from which chemicals can poured for use, and also larger containers from which the chemicals can be dispensed through gravity feed or pumping. One type of container which has heretofore been used for the storage and transport of chemicals is called an intermediate bulk container. During storage, it is often desirable to provide outlets through which selected quantities of the contents can be obtained for use. Often, the contents are dispensed from the containers through gravity feed, or alternatively pumps can be mounted to the container for pumping the contents for use. Also, it is often desirable to stack the containers during transport and storage.

Various types of apparatus for storage of liquids and dry materials have heretofore been developed. Examples of such apparatus include those shown in U.S. Pat. Nos. 5,430,927, 5,490,603, 6,079,580, 6,193,099, 6,247,594, 6,474,496 and 6,484,899, the entire disclosures of which are incorporated herein by reference. However, these systems are designed for use with a single container. In some instances, two or more chemicals in liquid or dry (e.g., powder, granular, etc.) form need to be stored separately and then mixed or otherwise combined at or near the time of use.

Thus, a need has developed for a system whereby containers can be securely stored and transported in a single system.

SUMMARY OF THE INVENTION

The present invention provides a system which facilitates the transportation and storage of a primary container in combination with one or more secondary containers in a single, economical, stackable arrangement. That is to say, the present system presents a significant advance in handling, transporting and storing chemicals where secondary containers are protected and stored in a system housing a primary container.

The system hereof broadly includes a base, a primary container nested into the base, and a top protector configured and arranged for mounting on top of the primary container, wherein the top protector is provided with a retainer and complementally configured with the primary container to receive one or more secondary containers in a nested configuration. The top protector is configured to receive a base of the same or similar configuration in stacked relationship on the top protector. Thus, a plurality of such systems in accordance with the present invention, each including the primary container and the secondary containers, can be stored and transported in stacked arrangement, thereby reducing the floor space necessary for storing a plurality of such systems.

Advantageously, the system is integrated such that the base, primary container, top protector and secondary containers all contribute to the stability and support of the system. This is particularly beneficial in transportation situations to inhibit relatively movement between the components of the system and to maintain the integrity of the system during dynamic conditions. In this regard, the top protector is preferably configured with a plurality of corner sections sized and arranged to support the base thereon, with connecting walls between the corner sections. A retainer is preferably provided to hold the secondary containers in nested positions between the corner sections, or alternatively in side by side arrangement extending into the interior of the top protector which is surrounded by the corner sections and connecting walls. The retainer can be integrally formed with the top protector, or more preferably provided as a separate member removably mounted to the top protector. The secondary containers may be bottles, jugs or the like of various sizes, and can include both containers which are substantially rigid as well as containers which are flexible such as bags which can contain liquid or dry ingredients such as those in granular, powder, pellet or other dry forms.

These and other advantages will be readily appreciated by those skilled in the art with reference to the drawings and detailed description which follows.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an isometric view of a protection and containment system for co-packaged containers in accordance with the present invention, showing a base, a primary container atop the base, a top protector mounted on the primary container, and a plurality of secondary containers nested in the top protector atop the primary container and held by retainers;

FIG. **2** is an exploded isometric view of the invention shown in FIG. **1**, showing the base, the primary container including its inlet and outlet, the top protector, and the secondary containers, with one of the retainers removed;

FIG. **3** is a top plan view, showing the nested position of the secondary containers within the top protector;

FIG. **4** is a front elevation view, showing how the top protector extends above the top of both the primary container and the secondary containers;

FIG. **5** is an enlarged vertical cross-sectional view taken along line **5-5** of FIG. **4**, showing the positioning of the secondary containers and the support shelves in the top protector for receiving another base thereon;

FIG. **6** is an enlarged, horizontal cross-sectional view taken along line **6-6** of FIG. **5**, showing an anchor for mounting the retainer embedded in the wall of adjacent corner sections of the top protector;

FIG. **7** is an isometric view of the system hereof wherein the retainer includes an additional strap and is thereby configured to hold a plurality of secondary containers;

FIG. **8** is an exploded view of the arrangement of FIG. **7** similar to FIG. **2**, showing one of the retainers removed from the top protector;

FIG. **9** is a top plan view of the arrangement of FIG. **7**, showing the positioning of the secondary containers within the top protector and atop the primary container;

FIG. **10** is an enlarged vertical cross-sectional view taken along line **10-10** of FIG. **9** and similar to FIG. **5**, showing each of the retainers holding a plurality of secondary containers; and

FIG. **11** is an enlarged horizontal cross-sectional view taken along line **11-11** of FIG. **10**, and showing the arrangements of the retainer and secondary containers between the corner sections.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing, a protection and containment system for co-packaged containers **20** broadly includes a base **22**, a primary container **24**, and a top protector **26** which includes a retainer **28** for retaining at least one secondary container **30**. The primary container **24** and secondary containers **30** may be used to hold chemicals in liquid or dry form. The base **22** is complementally configured with the primary container **24** so that the primary container **24** rests atop and is supported by the base **22** and is at least partially received therein. Similarly, the top protector **26** is complementally configured to mount on top of the primary container **24** and mate therewith.

In greater detail, the base **22** may be rotationally molded of synthetic resin such as high density polyethylene (HDPE) and is configured with legs **32** preferably located to extend downwardly at the corners of a generally rectangularly configured sidewall **34**. In addition, opposed stands **36** extend downwardly from the sidewall **34** between the legs **32** along two sides of the sidewall **34**, and feet **38** extend downwardly on the alternative two sides of the sidewall **34**. One of the stands **36** preferably includes an opening **40** for access to a tubular extension of the primary container **24** on which an outlet valve **42** may be mounted.

The primary container **24** is preferably rotationally molded of HDPE and is hollow to receive a chemical, most typically a liquid chemical, therein. The primary container **24** preferably includes a bottom wall **44** (seen in FIG. **4** through opening **40**), a top wall **46** and a surrounding sidewall **48**. The sidewall **48** is configured complemental with the sidewall **34** of the base **22**, and the bottom wall **44** is configured complemental with the base **22** so that the primary container **24** nests with the base and is at least partially received therein, with the bottom wall **44** supported, at least in part, on projections **50** molded into the base **22**. The top wall **46** is configured with four corner sections **52** which are separated by presents a pair of intersecting channels **54** and **56**. An inlet opening having a cap **58** is located at the intersection of the channels **54** and **56**. Each of the channels **54** and **56** preferably includes a preferably substantially planar floor **60** and a pair of opposed, upright channel walls **62**. In addition, access ports **64** with closures **66** may be provided along the planar floor **60**. The corner sections **52** preferably include corner shelves **68** and side shelves **70** and **72**.

The top protector **26** is configured to be complemental with the primary container **24** so as to fit therewith. In that regard, the top protector includes side walls **74** each having a downwardly extending lug **76** for receipt into the channels, the bottom surface of the lugs **76** being sized and configured to sit in the channels and rest on the planar floors **60**. The lugs **76** are unitary with and connect corner modules **78**. The corner modules **78** preferably include upright, generally planar risers **80**, configured such that two risers **80** of any corner module **78** are generally perpendicular to one another and each riser **80** of a corner module **78** is generally parallel to and opposite another riser **80** of an adjacent corner module **78** to which it is connected by a lug **76**. As seen in FIG. **1**, the opposed risers **80** are spaced apart by the width of the lug **76** connecting the respective two corner modules **78** and thus present a gap between the risers. Shoulder **82** extend laterally from each side of the lugs **76** and are sized and configured to rest on respective ones of the side shelves **70** and **72**. Each corner module **78** also includes a downwardly extending corner foot **84** which is complementally configured to rest on and be supported by the corner shelf **68** of the primary container **24**. The corner modules **78** also include a top surface **86** which includes a substantially planar corner deck **88** which is configured complemental with the legs **32** so that the legs are supported on the corner deck **88** when one system **20** is stacked atop another system **20**. The top surface **86** also includes an upwardly extending rim **90** which projects upwardly above the corner deck **88**. The rim **90** also projects above the top edge **92** of the lugs **76** and above side decks **94** which are sized and positioned to receive the stands **36** and feet **38** of a base **22** when the base **22** is stacked on the top protector **26**.

The retainers **28** may be provided of metal, nylon or other synthetic resin material, but more preferably are made of an elastomeric material such as, for example, natural or synthetic rubber or other synthetic resin material. The retainers **28** when mounted to the corner modules **78** have an elongated bight **96** and a pair of ends **98** and **100**. Each of the ends **98** and **100** is configured for mounting to the corner modules **78**. While this may be accomplished in various ways, such as by mounting lugs molded into the corner modules with complemental attachment receivers on the retainers, as shown in the drawings the ends **98** and **100** each have holes **102** and are temporarily attached by bolts **104** threaded into metal anchors **106** molded into the risers **80** of the corner modules **78**. Alternatively, the retainers **28** may be coupled directly to the top protector **26** using threaded fasteners, such as double-pitched self-tapping screws. As may be seen in FIG. **11**, two retainers **28**A and **28**B are provided, both being fastened to the same anchor **106** by a respective bolt **104**, but with the retainer **28**B being a strap of greater length than the retainer **28**A.

The secondary containers **30** have a smaller in volume than the primary container **24** and are configured so that several such secondary containers **30** may be nested into the top protector **26** in the gap between opposed risers **80**. The secondary containers **30** are typically synthetic resin jugs for containing liquid or dry chemical materials, and preferably have a height which, when the system **20** is assembled and the secondary container **30** is positioned resting atop the planar floor **60** and between opposed risers **80**, no part of the secondary containers **30** extend upwardly beyond the rim **90**. The secondary containers **30** when held by the retainers rest between two opposed risers **80** and against an interior surface **108** of a lug **76** or against another secondary container **30** as shown in the drawings.

The base **22**, primary container **24** and top protector **26** may be rotationally molded as separate components as is well known to those skilled in the art. Once molded, the retainers **28** are attached to the anchors **106** molded into the corner modules **78** by the bolts **104** as described above. The primary container **24** is inserted into the base **22**, and the top protector **26** is mounted atop the primary container **24**. It may be appreciated from the foregoing description and the drawings that the lugs **76** are received in the channels **54** and **56** of the primary container, with the corner feet **84** positioned atop the corner shelves **68**. When so assembled, the primary container **24** resists lateral movement with respect to the base **22**, and the top protector **26** resists lateral movement with respect to the primary container **24**. The secondary containers **30** may then sit atop the planar floors of the channels **54** and **56** and thus held in position not only by the channel walls **62** but also by the risers **80**. The retainers **28** further resist lateral movement of the secondary containers **30**, the secondary containers **30** being held between the bight of the retainer **28** and the interior surface **108** of the lug **76**. The top protector **26** not only permits stacking of several systems **20** one atop another, but because rim **90** extends upwardly above the height of each of the secondary containers **30** as shown in FIGS. **5** and **10**, protects the secondary containers **30** as well. Furthermore, access may be gained to the central opening of the primary

container **24**, and removal of the cap **58** can be accomplished without the necessity of removing the top protector **26**. The arrangement further permits different arrangements of the secondary containers **30**, their removal from the system **20** without the necessity of removing the top protector **26**, and the ability to pour their contents into the opening after removal of the cap **58** without removing the top protector.

Although preferred forms of the invention have been described above, it is to be recognized that such disclosure is by way of illustration only, and should not be utilized in a limiting sense in interpreting the scope of the present invention. Obvious modifications to the exemplary embodiments, as hereinabove set forth, could be readily made by those skilled in the art without departing from the spirit of the present invention. For example, the secondary containers may be bottles, jugs or the like of various sizes, and can include both containers which are substantially rigid as well as containers which are flexible such as bags which can contain liquid or dry ingredients such as those in granular, powder, pellet or other dry forms.

We claim:

1. A protection and containment system for co-packaged containers comprising:

a hollow primary container having a circumscribing upright sidewall and an opening configured for receiving material to be stored in the container;

a top protector complementally configured with the primary container for fitting therewith atop the primary container, said top protector including a side wall and at least a pair of spaced-apart opposed risers extending upwardly from the primary container above the opening and presenting a gap therebetween;

at least one retainer coupled to each of said pair of spaced-apart opposed risers and positioned interiorly of said side wall, said retainer being located and configured for holding a secondary container atop the primary container; and

a base complementally configured for receiving and supporting said primary container thereon and configured complemental to said top protector whereby a plurality of protection and containment systems can be stacked;

wherein said risers and side wall of said top protector and said retainer are located and configured to permit nesting of a secondary container in a gap between the risers and adjacent an interior surface of the side wall

wherein the primary container includes a bottom wall, a top wall, and wherein the sidewall is configured complemental and in substantial vertical registry with a generally rectangularly configured side wall of the base so as to extend upwardly therefrom when the primary container nests with and is supported by the base, the top wall of the primary container being configured with four corner sections separated by a pair of intersecting channels, each of said channels having a substantially planar floor and a pair of opposed, upright channel walls,

wherein each of the corner sections includes a corner shelf and a pair of side shelves,

the system further comprising at least one secondary container held by said retainer in the gap between said risers and sized whereby no part of said secondary container extends upwardly beyond a top rim of said top protector, and

wherein said side wall of said top protector includes a plurality of downwardly extending lugs sized and configured to be received into channels provided in the primary container with the lugs resting on the planar floors of the primary container.

2. A protection and containment system for co-packaged containers as set forth in claim **1**, wherein the primary container is molded of synthetic resin.

3. A protection and containment system for co-packaged containers as set forth in claim **2**, wherein the top protector is molded of synthetic resin.

4. A protection and containment system for co-packaged containers as set forth in claim **1**, wherein the side wall of top protector substantially in vertical alignment with circumscribing upright sidewall of the primary container.

5. A protection and containment system for co-packaged containers as set forth in claim **4**, wherein the top protector is configured to permit access to the opening of the primary container.

6. A protection and containment system for co-packaged containers as set forth in claim **1**, wherein the retainer is coupled to the risers by threaded fasteners.

7. A protection and containment system for co-packaged containers as set forth in claim **6**, wherein said risers include metal anchors molded into the risers, and wherein the retainer is coupled to the risers by threading the threaded fasteners into the anchors.

8. A protection and containment system for co-packaged containers as set forth in claim **6**, wherein the retainer includes a metal strap.

9. A protection and containment system for co-packaged containers as set forth in claim **6**, wherein the retainer includes a nylon strap.

10. A protection and containment system for co-packaged containers as set forth in claim **6**, wherein the retainer is of an elastomeric material.

11. A protection and containment system for co-packaged containers as set forth in claim **1**, wherein the top protector includes a plurality of corner modules, said risers being provided as part of said corner modules wherein two risers of any corner module are generally perpendicular to one another and lie generally parallel to and opposite one riser of an adjacent corner module, the corner modules being connected by said lugs, said lugs including a part of said interior surface of said side wall.

12. A protection and containment system for co-packaged containers as set forth in claim **11**, wherein each of said corner modules includes a corner foot sized and configured to rest atop a corresponding corner shelf of the primary container.

13. A protection and containment system for co-packaged containers as set forth in claim **12**, wherein each of said corner modules includes a top surface which includes a substantially planar corner deck, and wherein said base includes a plurality of legs, the legs being sized and configured whereby the legs of the base of one corner system may each rest atop a corner deck of a top protector of a second protection and containment system for co-packaged containers when two such systems are stacked one atop the other.

14. A protection and containment system for co-packaged containers as set forth in claim **13**, wherein said top surface also includes an upwardly extending rim which extends upwardly above said corner deck and above a top edge of the lugs.

15. A protection and containment system for co-packaged containers as set forth in claim **14**, wherein first and second retainers are provided, each connected by a threaded fastener to a respective one of said anchors, and wherein said second retainer having a greater length extending between anchors than said first retainer.

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